



Information of the Researchers

Main Research Themes

2022

Faculty of Environmental Engineering and
Graduate School of Environmental Engineering, The University of Kitakyushu
Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology
Graduate School of Information, Production and Systems, Waseda University
Fukuoka University Graduate School of Engineering
Fukuoka Research Commercialization Center for Recycling Systems

KITAKYUSHU SCIENCE AND RESEARCH PARK

You can see researchers information with
"the Kitakyushu Science and Research Park researchers information
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The access site is as follows,
http://fais.ksrp.or.jp/05kenkyusha/srch_e.asp



| Position | Name | Main Research Theme |
|---|---------------------|--|
| Department of Chemical and Environmental Engineering | | |
| Chemical Processes | | |
| Professor | Kenji Asami | Development of Novel Processes for the Production of Synthetic Clean Fuels and their Utilization |
| Professor | Xiao-Hong Li | I am working on the development of catalysts for synthesis of high-quality gasoline, diesel, jet fuel, methanol, hydrogen from natural gas, biomass, and carbon dioxide. |
| Professor | Kazuharu Yoshizuka | 1. Lithium recovery from various resources 2. Recycle system of rare metals from various wastes 3. Removal system of arsenic and boron from various water environments |
| Professor | Syouhei Nishihama | 1. Separation and recovery process of rare metals from waste materials 2. Removal process of toxic compounds in water environment |
| Advanced Materials | | |
| Professor | Isamu Akiba | 1. Synthesis, Properties and Structures of Organic Polymers 2. Mesomorphic Phase Formation of Multicomponent Polymer Materials |
| Professor | Seung-Woo Lee | 1. Nano-structured materials 2. Fabrication and application of chemical sensors 3. Analysis of disease odors |
| Professor | Katsutoshi Yamamoto | 1. Synthesis and application of new structures of porous materials 2. Development of new synthesis routes for porous materials 3. Development of catalysts for bio-fuel synthesis |
| Associate Professor | Takuya Suzuki | 1. Development of novel oxide photo catalyst 2. Development of environmental device using optical fiber and visible light |
| Associate Professor | Hiroyuki Imai | 1. Development of novel catalysts for application to catalytic reaction processes 2. Synthesis and functionalization of porous materials as a solid catalyst in processes of effective utilization of petroleum resources and production of chemicals from non-petroleum resources |
| Environmental Processes | | |
| Professor | Hitoshi Ohya | Development of recycling technology and its system design |
| Professor | Hidehiko Yasui | 1. Activated Sludge Population Dynamics 2. Anaerobic Digestion 3. Nutrient Removal and Recovery 4. Pretreatment of Industrial Wastewaters |
| Professor | Masahide Aikawa | Atmospheric Science(Acid Deposition (Acid Rain, Acid Fog), Air Pollution(Gaseous compounds, Particulate matter)) |
| Associate Professor | Mitsuharu Terashima | 1. Modeling and simulation of water and wastewater treatment process 2. Hydrodynamics in wastewater treatment plant |
| Associate Professor | Takashi Miyawaki | 1. Development of comprehensive analysis method for chemicals using mass spectrometry 2. Environmental pollution survey and ecological effect evaluation in Japan and overseas 3. Study on source analysis of chemicals in the environment |
| Department of Mechanical Systems Engineering | | |
| Energy Systems | | |
| Professor | Masaaki Izumi | 1. Study on Improvement of Performance and Endurance of Solid Oxide Fuel Cells 2. Study on Inspection and Diagnosis for Fuel Cell Performance 3. Study on Manufacturing of Fuel Cells by 3D Printing Technique |
| Professor | Yoshiaki Miyazato | 1. Measurements of Shock Train Oscillations by High-Speed Mach-Zehnder Interferograms 2. Three-Dimensional Density Measurements in Supersonic Jets Using Tomographic Rainbow Schlieren 3. RANS Simulations of Pseudo-Shock Waves in Scramjet Engines |
| Professor | Sadami Yoshiyama | 1. Development of Combustion Diagnostics Method Using Ion Sensor 2. Measurement and Modeling of Turbulent Premixed Flame in Internal Combustion Engine 3. Development of Waste Heat Recovery System for Reciprocating Internal Combustion Engines |
| Professor | Koichi Inoue | 1. Electronics cooling 2. Condensation heat transfer on a large tube bank 3. Heat spreader 4. Internal natural convection |
| Associate Professor | Shinichiro Nakao | 1. Research on applying non-contact measurement techniques to compressible flow fields 2. Research on methods to soup up small size wind turbines |
| Design and Manufacturing System | | |
| Professor | Takanori Kiyota | 1. Study on Mechanical System Control Method based on Inherently Safe Design 2. Development of Power Assist Systems based on Inherently Safe Control 3. Study on Safe and High-Performance Control of Pneumatic Systems |
| Professor | Nobuhiro Okada | 1. 3D visual measurement 2. Robotics 3. System engineering |
| Professor | Changhee Cho | Study on the Wear of Ultra-High Molecular Weight Polyethylene for Artificial Joints |
| Associate Professor | Takumi Sasaki | 1. Development of Nonlinear Vibration Isolator 2. Development of Vibration Analysis Method for Large Scale Systems 3. Development of Vibration Control Device using MR Fluid |
| Associate Professor | Hiroshi Murakami | 1. Development of a System for 3-D Micro Metrology Using an Optical Fiber Probe 2. Study on an intelligent machine tool 3. Development of a high-speed air turbine microspindle for monitoring machining processes |
| Associate Professor | Hiroki Cho | 1. Research for performance improvement of shape memory alloy 2. Research and development of actuator and medical equipment using shape memory alloy 3. Research and development of the heat-engine using shape memory alloy |
| Associate Professor | Takuya Ikeda | 1. Sparse modeling 2. Optimal control 3. Multi-agent system |
| Lecturer | Takeshi Miyaguni | 1. Development of small wind turbine with high efficiency and high selfstart ability 2. Study on waste collection system of a waste cleaning ship |
| Department of Information Systems Engineering | | |
| Signal Processing | | |
| Associate Professor | Ryo Matsuoka | Study on signal processing, image processing, and computer vision based on mathematical modeling, artificial intelligence, optimization/convex analysis |
| Systems Control | | |
| Professor | Lianming Sun | 1. Modeling and system design for control and communication systems 2. Adaptive signal processing |
| Professor | Kazumi Horiguchi | Systems and Control Theory |
| Associate Professor | Yusuke Fujimoto | My research interests include 1. identification of linear or nonlinear systems 2. data-driven controller designs 3. applications to practical systems |
| Networking | | |
| Associate Professor | Hiroyuki Koga | 1. Computer Communication Networks 2. Internet Architecture |
| Lecturer | Yusuke Ito | 1. Edge cloud computing 2. Information-centric networking |

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| Security | | |
| Professor | Satoshi Uehara | Sequence design for communications applications |
| Professor | Yasushi Yamazaki | 1. Biometrics 2. Information security 3. Pattern recognition 4. Time series analysis |
| Integrated Systems | | |
| Professor | Shigetoshi Nakatake | 1. VLSI Physical Design 2. Mixed Signal LSI Design 3. Sensor System Integration 4. Analog Reconfigurable Device |
| Professor | Makoto Sugihara | 1. VLSI design technique 2. Embedded system designs 3. IT system design for advanced driver assistance |
| Professor | Yasuhiro Takashima | 1. Algorithms to VLSI system layout design 2. Optimization Method 3. Mathematical Programming |
| Communications and Sensing | | |
| Specialty Appointed Professor | Akihiro Kajiwara | 1. Radio communication systems 2. Microwave/Millimeter wave propagation 3. Automotive radar and health-care radio sensor |
| Sensing and Robotics | | |
| Professor | Takeshi Nishida | 1. Research on AI robots for smart factories 2. Research on intelligent robots by integrating cyberspace and real space |
| Software | | |
| Associate Professor | Susumu Yamazaki | 1. System implementation to solve issues of information quantity explosion including the Elixir programming language 2. Social Implementation to realize the future of regions, environment and the world with regional industries and entrepreneurs 3. Acceleration and applied social implementation of satellite image processing |
| Biomedical Engineering and Human Information Processing | | |
| Professor | Masayuki Sato | Psychophysics on human visual perception, especially on depth perception and visual stability during eye movements |
| Associate Professor | Takehito Hayami | Medical equipment based on electric and optic technology to diagnose and treat nervous functions (neurosurgical, ophthalmological and orthopedic applications) Psychological equipment to test human behaviour |
| Associate Professor | Yasuaki Tamada | 1. Proposition of multi-modal stimulation method for 3D or VR contents 2. Development of applications for visual function diagnosis |
| Department of Architecture | | |
| Structure and Construction | | |
| Professor | Masae Kido | Seismic Design and Frame Stability of Steel and Concrete Filled Steel Tubular Structures |
| Associate Professor | Kazuaki Hoki | 1. Evaluation of Seismic Performance of Old Building 2. Development of Seismic Retrofit |
| Associate Professor | Shinnosuke Fujita | Research on application of the optimization method into practical design, Development of the computational design tool based on mathematical engineering, Research on mechanical/structural characteristics of shell & spatial structures, Structural design and digital fabrication |
| Building and Construction Materials | | |
| Professor | Koji Takasu | 1. Development of cement-free concrete contributing to CO ₂ reduction targets of the Paris Agreement 2. Study on modification of recycled building materials 3. Study on properties of labor-saving construction type low carbon concrete 4. Study on properties of the concrete using recycled aggregate and high volume by-products particles 5. Environmental impact assessment considered performance of building material 6. Study on analysis and test method of concrete by various analysis devices |
| Professor | Hidehiro Koyamada | 1. Safety management in buildings 2. Hot weather concreting 3. Medium fluidity concrete 4. Sustainable system of forest resources 5. Building resource supply system in Japan 6. Research and maintenance of existing and aged buildings |
| Associate Professor | Hiroki Suyama | 1. Performance of concrete containing by-product powder 2. Pore structure in concrete 3. Composition of different concrete 4. New building material made from by-product |
| Building Environment and Energy System | | |
| Executive Director, Vice-president, Professor | Yuji Ryu | 1. Natural energy utilization technologies in buildings 2. Analysis on thermal storage HVAC systems 3. Field study on Sick House in the Kyushu District |
| Professor | Weijun Gao | 1. Architectural/urban environment planning/design 2. Building/city energy and resource planning 3. Study on urban environment in Asia |
| Professor | Yasuyuki Shiraishi | 1. Advanced air-conditioning system to realize energy saving and comfort 2. Development of performance prediction method of various passive environmental control systems 3. Environmental control engineering for large scale building based on CFD analysis |
| Associate Professor | Shintaro Ando | 1. Effect of thermal environment on health (e.g. blood pressure, physical activity, sleep quality, and body temperature) 2. Effect of community environment on physical activity |
| Architectural Design | | |
| Professor | Hiroatsu Fukuda | 1. Architectural Design 2. Design of Recyclable Houses, Low-Energy Houses, Recycle of Construction Materials 3. High-Rise Residences 4. Urban Environment, Urban Design, Compact City 5. New construction methods of Japanese cedar 6. Historical Architecture |
| Professor | Bart Julien Dewancker | 1. Research on urban planning and citizen involvement in urban planning 2. Research on Sustainable Architecture and Urban Design 3. Landscape planning, green buildings |
| Associate Professor | Yumi Fukuda | 1. Study on light regulating human biological rhythms 2. Study on light environment and color planning which develop vision 3. Lighting design in public spaces 4. Study on illumination |
| Lecturer | Hiroshi Yamada | 1. Composition of industrialization and humanity, Life image drawn by modern architecture 2. A new learning space that makes use of the surrounding nature, Proposals for awareness and emotional education in childhood 3. Correlation between traditional settlements and urban development in Asia 4. Urban farms and dwelling forms, Expansion of production green space in rural residential area |
| Department of Life and Environment Engineering | | |
| Life Science and Biomaterials | | |
| Dean, Professor | Kazuya Uezu | 1. Biosensors utilizing the structures and functions of living organisms 2. Biomaterials for capturing the intracellular messengers 3. Design of functional materials with computational chemistry 4. Environmentally-friendly firefighting foam for forest fire |
| Professor | Kohji Nakazawa | 1. Development of cell array 2. Development of sensing technology of cell functions 3. Study of tissue engineering using cultured cells |
| Professor | Takaaki Isoda | Development of a new bio sensor and the application, 1. Food poisoning tests 2. Skin allergy tests 3. Infection test kit |

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| Associate Professor | Shinichi Mochizuki | 1. Development of drug delivery system 2. Novel immunotherapy 3. Glycoengineering 4. Nucleic acid chemistry |
| Biological and Ecological Engineering | | |
| Professor | Akira Haraguchi | 1. Evaluation of the soil - water - plants interaction in the terrestrial and wetland ecosystems and the rehabilitation of the damaged ecosystems 2. Eco-physiological study on aquatic plants and their function on environmental protection 3. Chemical process of limnological ecosystems with special reference to redox reaction and decomposition of organic materials |
| Professor | Hiroshi Morita | 1. Study on physiological function of IGUSA 2. Bio-control science of mold spores and mites 3. Study on novel co-culture Koji for Sake brewing 4. Development of submerged culture system for brewing |
| Professor | Tomonori Kawano | 1. Plant Biology and Microbiology 2. Cell Signaling 3. Redox biochemistry 4. Environmental Science and Technology 5. Metal eco-toxicity 6. Biosensing and microbiorobotics 7. Fire-fighting technologies and bioengineering 8. Science history 9. Blood biology and biochemistry 10. Fish bioengineering |
| Associate Professor | Takanori Kihara | 1. Biomineralization in our body 2. Phenotypic regulation of smooth muscle cells 3. Tissue formation with stem cells |
| Associate Professor | Katsunori Yanagawa | Microbial distribution, community composition and biogeochemical cycles in the geobiosphere including extreme environment |
| Environmental Management | | |
| Professor | Tohru Futawatari | Regional environmental management |
| Professor | Takaaki Kato | 1. Economic evaluation of environmental and energy policy 2. Evaluation and governance of risk |
| Associate Professor | Atsushi Fujiyama | 1. Study on energy management systems 2. Study on using information technology in the environmental field |

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| Position | Name | Main Research Theme |
|-----------|------------------|--|
| Professor | Kazuo Sakurai | 1. Polymer Physics 2. Biopolymer 3. Biochemistry |
| Professor | Tsuruo Matsuda | Biomedical Eng., and so on Magnetic and Electrical stimulation of the Human Brain, peripheral nervous system and Blood flow system |
| Professor | Masaaki Nagahara | My research interests are fundamental theory of automatic control and artificial intelligence, and their applications to vehicles, drones, power systems, and acoustics. |
| Professor | Kyozo Kanamoto | 1. Research on characterization, improvement and monitoring in reliability of power electronics modules 2. Research on cooling technology for power electronics modules |
| Professor | Toru Matsumoto | 1. Sound material-cycle society and industrial symbiosis 2. Urban environmental management in Asia 3. Servicing as sustainable business models 4. Environmentally conscious life style |

Center for Fundamental Education, Hibikino Campus, The University of Kitakyushu

| Position | Name | Main Research Theme |
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| English Education | | |
| Professor | Tetsuya Kashiwagi | 1. Learner Corpus Compilation and Analysis for Pedagogical Application in Mitigating L1 Interference 2. Grammar Teaching as a Clue to Output Pedagogy 3. Contrastive Rhetoric Study in Variation and Context |
| Professor | Masanobu Ueda | A quantitative and qualitative analysis of verb semantics and constructions |
| Associate Professor | Eiichiro Tsutsui | 1. English education 2. EFL with information and communication technology 3. Creating web apps for Japanese learners of English 4. Analyzing computer-mediated communication data |
| Associate Professor | Roger J.A. Prior | Translation studies, particularly the potential for translating jokes and humour |
| Associate Professor | Anne Marie Crescini | 1. Research on the Effectiveness of Using Study Abroad as One Way to Improve Language Ability and Increase Cultural Awareness 2. Research on the Relationship between Foreign loanwords and the English Pronunciation of Native Japanese Speakers |
| Associate Professor | Naoki Kiyama | Multi-factorial analysis on the English Quotative Constructions |
| Japanese Education | | |
| Professor | Ryusuke Ikeda | 1. Japanese for Specific Purpose 2. Analysis of The Features of Language Adjustment of Japanese Native Speakers 3. Development of Learning Resources for International Students Majoring in Environmental Engineering 4. Research on Academic Writing Education in Japanese |
| Liberal Arts | | |
| Professor | Hiroyuki Tsujii | Research on Management for Sustainability 1. Corporate Environmental Management 2. Engineering Ethics Education 3. Business Education |
| Associate Professor | Miyuki Nakaoka | I am engaged in a comparative study of urban mechanisms and urban structures in Asian countries, focusing especially on China. I am also interested in the differences between the Japanese economy during its rapid growth period and the present Chinese economy. |
| Associate Professor | Fumitoshi Murae | I am studying the way education should be for solving various social issues, including environmental problems. |

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| Position | Name | Main Research Theme |
|--|-------------------|--|
| Department of Biological Functions Engineering | | |
| Green Electronics | | |
| Professor | Tsuyoshi Hanamoto | Development of human-friendly and environmentally friendly electrical power conversion systems and application for motor control systems |

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| Professor | Ichiro Omura | Development of ultimate power semiconductor devices aimed at achieving extreme energy conservation, development of integrated power electronics to realize micro-miniaturization, development of real-time monitoring technology to detect failure causes of power semiconductor devices, and research of power electronics control and its integration with the digital network |
| Professor | Tingli Ma | 1. Development of functional nano materials 2. Organic and inorganic molecular devices 3. Fuel Cell 4. Na and Li ion battery 5. Supercapacitor |
| Professor | Shyam Sudhir Pandey | 1. Development of functional dyes and polymers 2. Research on next generation solar cells 3. Development high performance bio-image sensors |
| Associate Professor | Akihiko Watanabe | Diamond power device and High Reliability Technology |
| Biological Mechanics | | |
| Professor | Hiroshi Yamada | 1. Mechanical evaluation of human vascular diseases and its application to medical treatment 2. Macroscopic and microscopic studies of soft tissues to avoid pressure injury, mechanical evaluation of pressure redistribution mattresses 3. Computer simulation to improve the tooth repair technique |
| Professor | Masaaki Tamagawa | 1. Drug Delivery Systems by Shock Waves 2. Bioprocess by Shock Waves 3. Prediction of Haemolysis and Thrombus in Blood Pumps 4. Application to tissue engineering by shock waves 5. Development of shock wave generator 6. Multi-fractal analysis for branch flow of blood pipe using medical image data 7. Water Treatment Systems by shock waves and cavitation flows |
| Dean, Professor | Takashi Yasuda | Using techniques of microfabrication and cell culture, we are developing biomedical microdevices such as microfluidic devices for single cell analysis, microelectrode array devices for extracellular potential measurement, microhole array devices for production/separation of extracellular vesicles, etc. |
| Professor | Toshiki Miyazaki | Development of functional biomaterials for tissue repairing |
| Associate Professor | Kazuto Takashima | 1. Development of soft tactile sensor 2. Development of device placement simulator for endovascular treatment 3. Applications of shape-memory polymer and artificial muscle to human-interactive robot |
| Associate Professor | Momoko Kumemura | Applying MEMS (Micro Electro Mechanical Systems) technology to biological research at the molecular, cellular, and tissue level Development and characterization of novel micro-devices for mechanical, chemical, and genetic assays for oncological studies. |
| Associate Professor | Jin Nakamura | 1. Synthesis of organic-inorganic hybrid materials for promoting regenerations of bone and blood vessels 2. Evaluation of mammalian cell response to material decomposition products 3. Synthesis of carbonate fine particles for purification of seawater |
| Specially Appointed Professor | Satoshi Iikubo | 1. Development of the calculation techniques for the materials design 2. Hydrogen diffusion behavior in the steel 2. Battery materials (solid electrolyte, electrode) 4. Perovskite solar cell |
| Environmentally-Conscious Chemistry and Bioengineering | | |
| Professor | Tetsuya Haruyama | We are conducting research and development of chemical technologies that contribute to the realization of a sustainable society through elemental circulation. We are working on research topics such as "conversion of CO ₂ to resources", "efficient nitrogen fixation", "high concentration generation of active oxygen", and application of active oxygen to industrial processes. We are developing from basic research to applied technology (commercialization). |
| Professor | Toshinari Maeda | 1. Microbial biodegradation of environmental pollutants 2. Bioenergy production and low-carbon technologies using bacterial functions 3. Reduction and recycling of excess sludge to construct an environmentally-friendly technology 4. Probiotics for periodontal pathogens 5. New anti-microbial technologies by predatory bacteria |
| Associate Professor | Tamaki Kato | Study on the functioning structures of biopolymers and the building superstructures |
| Associate Professor | Minato Wakisaka | Toward the creation of a "sustainable society-ecological system," we are conducting research on the two cycles, biological and technological, that form the basis of the circular economy (the former is the utilization of biomass and the latter is the recycling of plastics). |
| Associate Professor | Naoya Murakami | 1. Development of photo-functional nanomaterials for photocatalyst and photovoltaic cell 2. Spectroscopic analysis for elucidation of photoreaction mechanism over semiconductors |
| Associate Professor | Shinya Ikeno | 1. Bioassay by using functional gold nanoparticles 2. Spore detection using nanoparticles to enhance the Raman signal 3. Boost protein expression system by co-expression of functional peptide 4. Development of functional peptides to improve stress tolerance |
| Associate Professor | Yoshito Ando | Fabrication of functional materials through up-graded recycle of biomass and waste materials aiming to be sustainable materials society 1. Development of sustainable bioplastics 2. Nano-fibrization of unutilized agricultural wastes 3. Developments of high-performanced functional material made from biomass/industrial waste 4. Functional materialized biomass and industrial waste through surface modification |
| Assistant Professor | Yoshiyuki Takatsuji | Development of electrode for efficient conversion between energy and substance about environment We have developed research to convert atmospheric substances such as carbon dioxide and nitrogen into useful substances such as industrial raw materials by using electrochemical approach. |
| Green Technology | | |
| Visiting Professor | Iwao Sasaki | Research on the optimization of the control mechanisms for mechatronics systems and human-friendly supporting devices |
| Visiting Professor | Hideki Honda | Realization of high-performance Mechatronics control system |
| Visiting Professor | Toru Kato | Development of the electrochemical energy devices such as the solid oxide fuel cells (SOFC), the high temperature steam electrolysis cells (HTSE) Study of evaluation and the simulation techniques for the electrochemical energy devices and systems |
| Collaborative Research Laboratory | | |
| Specially Appointed Associate Professor | Masahiro Nakano | Plant Life Cycle Engineering (Research on autonomously controlled robot welding, and Research on thermal elasto-plastic analysis of welds and optimization of welding order) |
| Department of Human Intelligence Systems | | |
| Human Intelligence and Machines | | |
| Professor | Kazuo Ishii | 1. Robotics 2. Intelligent Mobile Robot 3. Control System based on Neural Network |
| Professor | Hirofumi Tanaka | We try to decrease power consumption of AI computation by developing device mimicking biosignals based on material science. 1. Brain signal reproducing using nanocarbon network AI devices 2. Development of metallic and metal-oxide nanoparticles utilized for brain type AI computing 3. Haptic sensor for robot and artificial skin 4. Development of low dimensional nanomaterials for next generation electric wiring |

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| Professor | Chikamune Wada | 1. Research on human characteristics in order to develop assistive devices for the disabled 2. Application of the results to human interface, virtual reality and robotics |
| Professor | Hakaru Tamukoh | A brain-like computer system laboratory aims to realize a brain-like computer and its application to human-friendly systems. We integrate state-of-the-art devices, such as field programmable gate arrays, many-core central processing units, and Internet, to achieve high performance, low-power consumption, and flexible processing. To enable a brain-like computer, we integrate it with an artificial model of learning and growing structures. Furthermore, we widely apply the brain-like computer to an autonomous robot for supporting daily life and a human-friendly interface system including intelligent image processing and recognition. |
| Associate Professor | Hiroyuki Miyamoto | Generation of arm movement trajectory based on minimization principle, Robot learning by watching |
| Associate Professor | Shinsuke Yasukawa | Development of living creature observation / manipulation technique using robot, Development of bio-inspired sensor and embedded system, Trials of their techniques in field, etc... |
| Associate Professor | Yuuya Nishida | Fishery resource survey using Autonomous Underwater Vehicle Underwater 3D scanner using structured light method Ultra-wide area seafloor survey using unmanned vehicles |
| Assistant Professor | Yuki Usami | 1. Study of the fundamental physical properties of conductive polymers and metal nanoparticles 2. Development of evolutionary electronic devices for information processing inspired by brain using physical resource |
| Specially Appointed Professor | Osamu Nomura | Research and development of brain-like AI models and circuit architectures. |
| Specially Appointed Professor | Takashi Morie | VLSI circuits, devices and systems for brain-like artificial intelligence |
| Project Assistant Professor | Seiji Uenohara | 1. Development of neuromorphic CMOS integrated circuits 2. Development of neural network models suitable for circuit implementation 3. Nonlinear circuits and time-series analysis |
| Intelligence Systems and Emergent Design | | |
| Professor | Tetsuo Furukawa | 1. Meta-modeling method to discover general model and representation from multiple datasets 2. Visual analytics of data complex 3. Interactive intelligence that learns various dynamics and kinematics |
| Professor | Tomohiro Shibata | Basic and applied research, as well as social implementation on Robotics, behavioral neuroscience, and smart life care Other keywords include machine learning, artificial intelligence, biological signal measurement, soft robotics, medical care, etc. |
| Professor | Keiichi Horio | 1. Measurement and analysis of human behavior and internal state 2. Modeling and analysis of influence of human internal state on behavior and performance 3. Development of intelligent information processing method that imitates expert reasoning mechanism 4. Application of image processing, signal processing and optimization to real problems |
| Professor | Sozo Inoue | <Human Activities in the World and Curing Future Diseases> We research technologies to recognize human activities from sensor data gathered from smartphones/devices and utilize them for various healthcare services. We also cultivate AI while gathering medical and nursing care big data. |
| Professor | Hiroaki Wagatsuma | 1. Bio-medical signal processing, efficient sparse coding and the applications 2. Artificial intelligence, system design, rehabilitation supports inspired from non-linear dynamics in the brain-body-environment coordination 3. Sport dynamics and synergy analysis based on mathematical methods focusing on the non-linearity 4. Computational neuroscience based on theta phase coding and brain-inspired robotics |
| Associate Professor | Kaori Yoshida | She is engaged in research on Human-Computer Interaction, especially Kansei information processing that treats human subjective information, to design human-friendly information systems. |
| Associate Professor | Shuuhei Ikemoto | His research interests includes biologically inspired robotics and algorithms and physical human-robot interaction. |
| Assistant Professor | Hideaki Ishibashi | 1. Theory construction for meta-learning 2. Algorithm development for general rule estimation and meta knowledge discovery based on meta-learning theory 3. Applying to cognitive science such as mathematical modeling of self-understanding and cognitive viewpoint analysis |
| Human Interaction and Brain Functions | | |
| Professor | Kiyohisa Natsume | 1. Electrophysiological and computer simulation studies on the role of brain rhythm or neuronal oscillation in the information processing 2. Glial $[Ca^{2+}]_i$ oscillation and wave 3. Brain Simulator 4. E-learning system for English rhythm using Brain Computer Interface 5. Detection of Music preference using Brain Wave |
| Professor | Doosub Jahng | Occupational Health Marketing, Health Resources Management, Team Management, Communication |
| Associate Professor | Katsumi Tateno | 1. Neurodynamics 2. Chemical sensor array inspired by mouse taste buds |
| Associate Professor | Yoshitaka Otsubo | Research for taste transduction mechanisms |
| Human Technology | | |
| Visiting Professor | Hiroshi Nakajima | Research and development on algorithms of intelligent systems by studying soft computing, statistical analysis, and social intelligence in human-machine collaboration with application studies |
| Visiting Associate Professor | Takayuki Matsuo | 1. Biomimetic robot 2. Embedded system |

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| Position | Name | Main Research Theme |
|-----------|--------------|---|
| Professor | Yasushi Sato | 1. Controlling of Device Installed Artificial Intelligence 2. Sound Compression and Noise Removal by Sound Signal Process 3. Noise Removal by Array microphone 4. High Quality Sound and Lossless Compression by Sound Signal Process 5. Interface by Dialogue System 6. High Quality image and Search System by image Processing Technology 7. Development of Microwave Parts Using Dielectric |

Research Center for Neuromorphic AI Hardware

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| Position | Name | Main Research Theme |
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| Assistant Professor | Yuichiro Tanaka | 1. Development of brain-inspired artificial intelligence models 2. Development of fast and low power hardware for artificial intelligence models 3. Application for home service robots |

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| Position | Name | Main Research Theme |
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| Information Architecture Field | | |
| Dean, Professor | Shigeru Fujimura | 1. Production Planning and Scheduling 2. Production Management 3. Project Management 4. Digital transformation 5. Business Process Modeling |
| Professor | Jinglu Hu | Neurocomputing Systems and their Applications to Identification and Control of Nonlinear Systems |
| Professor | Mizuho Iwaihara | 1. Database Query Processing 2. Web Information Systems 3. Text Mining 4. Social Media 5. Security and Privacy |
| Professor | Seiichiro Kamata | 1. Image Processing 2. Pattern Recognition and Computer Vision 3. Applications of Space-filling curves 4. Image & Video Retrieval 5. Visual Information Processing |
| Professor | Yves Lepage | 1. Natural language processing and Artificial Intelligence 2. Example-based, statistical and neural machine translation 3. Study of analogy, application to morphology, syntax and semantics, machine translation and paraphrasing 4. Multilingual word and sentence alignment 5. Academic writing aid system for researchers who are non-native English speakers |
| Professor | Takafumi Matsumaru | Bio-Robotics & Human-Mechatronics 1. Remote Operation System of Mobile Robot 2. Preliminary Announcement of Mobile Robot's Intention 3. Form and Movement of Human Synergetic Robot 4. Interaction with Human Symbiotic Robot 5. Measurement and Analysis of Human Motion and Behavior 6. Systematic Learning on Mechatronics |
| Professor | Makoto Tsubokawa | 1. Optical network architecture (Survivable network architecture, Maintenance techniques, Transmission systems) 2. Sensing technologies (Fiber-optic sensors, Optical measurement techniques) 3. Optical waveguide design (Optical fiber textile, Light concentrator, Nano waveguide devices) |
| Professor | Osamu Yoshie | 1. Global machine diagnosis service using the Internet technologies 2. Environmental Information Processing 3. IoT application to manufacturing 4. Analysis of consensus building 5. Knowledge logistics |
| Professor | Jun Wu | 1. Network Intelligence 2. Network Security 3. Application and System Development for Intelligent Security 4. International standard for security management of intelligent networks |
| Lecturer | Yuya Ieiri | 1. Agent Simulation 2. Cyber-Physical System 3. Augmented Reality 4. Information Utilization for Revitalizing Community 5. Social System Construction in Collaboration with Stakeholders |
| Production Systems Field | | |
| Professor | Hee-Hyol Lee | 1. Development of Binary Power Generation Plant 2. Bayesian Network and Production & Inventory Control 3. Cellular Automaton and Traffic Flow Modeling 4. Traffic Signal Control 5. Cooperative Action Learning of Carrier Robot Swarm 6. Design of Decoupling Control System for MIMO Large-Scale Systems 7. Design of Sliding Mode Control System and Its Applications to Servo-Systems and Process Systems 8. Intelligent Control 9. Stochastic Control |
| Professor | Takeo Miyake | 1. Smart contact lens using integrated circuits 2. Wearable biofuel cell using enzyme catalysts 3. H ⁺ -mediated control of biofunction with electrochemical pH modulation 4. DDS system with nanostraw membrane |
| Professor | Eiichiro Tanaka | 1. Automatic Remote Diagnosis of Gear Driving System Using a Small Laser Sensor 2. Development of a Walking Assistance Device for Gait Training of Patients and Promotion Exercise of the Elderly 3. Development of Various Assistance Devices for ADL, lifting up and standing up, etc. |
| Professor | Shigeyuki Tateno | 1. Development of fault detection and diagnosis systems for chemical plants 2. Estimation of Corrosion Rates for Corrosion Under Insulation in Petrochemical Plants 3. Wireless Communication support system for rescue actions 4. Development of on-demand PC BTO systems |
| Professor | Kohei Tatsumi | 1. Semiconductor Packaging Materials and Technologies 2. Electronics Materials 3. Microstructure in Crystalline Materials 4. Materials and technologies for energy and environment field |
| Professor | Kenji Ueda | 1. Electronic functional materials 2. Thin film growth 3. Carbon electronics 4. AI electronics |
| Professor | Masahide Inuishi | 1. Power electronics (Conversion circuit) 2. Power semiconductor devices ①Structure design and process ②Reliability study 3. Modeling of advanced power devices for circuit simulation |
| Professor | Junko Takahashi | 1. Development of therapeutic methods using radiation responsive organic compounds (radiosensitizers) 2. Analysis of micro changes of physiological status |
| Lecturer | Gabor Mehes | 1. Bacterial electronics devices (energy conversion, sensing) 2. Extracellular electron transfer 3. Bioelectrode engineering by organic electronics materials |
| Integrated Systems Field | | |
| Professor | Takeshi Ikenaga | Video compression, video filter and video recognition systems |
| Professor | Shinji Kimura | High Level System LSI Design and Verification, Design for Testability |
| Professor | Shoji Makino | 1. Blind Source Separation 2. Speech Enhancement 3. Speech Dereverberation 4. Microphone Array 5. Acoustic Scene Analysis 6. Acoustic Event Detection 7. Acoustic Scene Classification |
| Professor | Hirofumi Shinohara | 1. Static and dynamic random number generators for security (PUF Physical Unclonable Function, TRNG True Random Number Generator) 2. Stochastic computing and application to Bayesian inference 3. Energy Efficient circuits and systems |
| Professor | Shintaro Yamasaki | 1. Structural optimum design of various integrated devices such as power semiconductors and optical MEMS 2. Integrative optimal design of integrated systems composed of integrated devices 3. Optimal design of other devices |
| Professor | Toshihiko Yoshimasu | 1. RF IC circuit design methodologies such as power amplifiers, VCOs, filters, and so on 2. RF transistor modeling for SiGe HBTs, Si CMOS, and so on |
| Associate Professor | Tamio Ikehashi | Micro Electro-Mechanical Systems (MEMS) 1. MEMS Sensors (accelerometer, vibrometer, gravimeter, gyro, etc) 2. Sensor system (pressure/ height monitoring) 3. Actuator devices 4. FEM simulation 5. MEMS fabrication |
| Associate Professor | Takaaki Kakitsuka | Information-communication systems employing light emitting devices 1. Semiconductor lasers and light emitting devices 2. Optical circuit design 3. Nanophotonics 4. Optical signal processing |

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|---------------------|--------------------|---|
| Associate Professor | Kiyoto Takahata | Opto-electronic integration technology 1. Opto-electronic integrated circuits 2. High functional optical devices 3. Photonic microwave/millimeter-wave devices |
| Professor | Takashi Ohsawa | Emerging memory system 1. In-memory computing 2. Nonvolatile working memories 3. Storage class memory (SCM) 4. Neuromorphic system |
| Lecturer | Shinichi Nishizawa | 1. Computer-Aided Design related to VLSI physical design: cell library design, timing analysis, variation aware design, low voltage and low energy design techniques 2. Process variation and aging induced transistor performance variation evaluation and its monitor circuit |

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| Position | Name | Main Research Theme |
|---------------------|-----------------|---|
| Junior Researcher | Tomonori Iizuka | 1. Nano/Micro-Composite Insulator Materials for Electronics Device Packaging 2. Voltage Endurance Improvement and High Thermal Conductivity Characteristics by Nano/Micro-composite Technologies |
| Assistant Professor | Saman Azhari | 1. CNT/PDMS nanocomposites for pressure sensing and robotics 2. topological effects of SWNT-POM reservoir computing on temporal information processing 3. wireless power transfer for sensors 4. synthesis and characterization of carbon nanotubes |
| Assistant Professor | Keisuke Osawa | 1. Minimally invasive medical devices 2. Remote rehabilitation system |
| Assistant Professor | Kunyang Liu | 1. IC design of physically unclonable function (PUF) circuits 2. Hardware security |
| Research Associate | Weilian Zhou | 1. Image processing 2. Hyperspectral imaging with deep learning 3. Remote sensing |
| Research Associate | Yukun Chen | A biodevice controls biological functions with ionic signals |
| Research Associate | Keiko Koshiba | 1. Semiconductor Packaging Materials and Technologies 2. Electronics Materials 3. Microstructure in Crystalline Materials |
| Research Associate | Mengchu Fang | 1. RF IC circuit design methodologies for high-frequency VCOs 2. Simulation methodologies for RF analog circuits |

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| Position | Name | Main Research Theme |
|-------------------------------------|-------------------|--|
| Recycling and Eco-Technology | | |
| Professor | Yasuo Yanagibashi | Water Supply System, Odor Measurement |
| Associate Professor | Kazuo Tameda | Waste Management System, Total system for the landfill |

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| Main Research Theme |
|--|
| <p>◇Research and development function Studies improving social system concerning waste disposal, such as separate collection, recycling technology, are carried out synthetically by cooperating with industries, governments, universities, and citizens.</p> <p>◇Practice support function Regional development and making the result of the research achieved by a joint research are supported.</p> <p>◇Environmental information function Information on recycling technology and the social system are sent, and the measure of related each subject for the construction of the recycling society is supported.</p> |



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